How Far Can Respirable Dust Actually Travel?

by nosilicadust | Sep 24, 2019 | Silica Dust Regulations, Silica Series | 0 comments

Respirable dust is invisible to the human eye but can pose serious health hazards. Exposure to respirable silica dust, which is fragmented crystalline silica, can lead to silicosis, lung cancer, and COPD. As a result, OSHA has instituted regulations to reduce the permissible exposure limit (PEL) of respirable silica dust on construction sites. These new reduced PELs have been in effect since September 23, 2017, however they only protect machine operators. There are no regulations for bystanders or enforced protections for surrounding civilians. Unfortunately, the nature of respirable dust particles can put bystanders at risk of inhalation exposure far beyond the confines of the construction site.

Dust size is important in determining potential associated health hazards. Dust particles need to be smaller than 200 microns to become airborne and smaller than 10 microns to be classified as "respirable." Respirable dust is able to penetrate the body's natural defenses and travels to the lungs which

can lead to serious health hazards. Naturally, the size of the dust particle dictates how far it travels when airborne. Wind speed is another contributing factor to distance traveled: as wind speed increases, so does the distance traveled of the respirable dust particles.

The following tables demonstrate the relationship between particle size, wind speed, and distance traveled:

X = construction site

◯ = area exposed to silica dust

Table 1: 10-micron particle

Wind Speed (mph)	Distance Traveled (miles)
3.1	.55
6.2	1.1
12.4	2.3
24.8	4.6
37.3	6.9
49.7	9.2

Table 2: 5-micron particle

Wind Speed (mph)	Distance Traveled (miles)
3.1	2.2
6.2	4.5
12.4	9
24.8	18
37.3	27
49.7	36.1

Clearly, the smaller the particle the further the distance the dust particle travels, especially in an environment with stronger winds. While these are average distances, this phenomenon illustrates how pertinent it is for proper engineering controls to be in place when it comes to suppressing silica dust. Failing to properly control silica dust affects not only the construction crew, but people in the surrounding areas- in some cases as far as 50 miles from the site.

NeSilex, a revolutionary silica dust suppressant manufactured by Chemtek, Inc, is the superior engineering control method for silica dust on construction sites. Adding NeSilex to a water delivery system chemically changes the structure of water allowing it to more easily encapsulate silica dust and prevent it from becoming airborne in the first place. NeSilex has been tested in many construction activities including sweeping and milling and in some cases, has resulted in 100% reduction in respirable silica dust.

It's important to protect not only your workers, but they aren't the only ones at risk of respirable silica dust exposure. Civilians, bystanders, and neighborhoods in the vicinity of any construction site are at risk!

[nz_btn text="Call 800-672-8536 to learn about safety solutions for your operations!" link="chemtekinc.com/contact/contact-us/" target="_self" icon="" animate="false" animation_type="ghost" color="blue" size="medium" shape="rounded" type="normal" hover_normal="fill" hover_ghost="fill" el_class="" /]

Source:

[1] Respiratory and Allergic Immune Response Impacts of Gravel Pit/ Quarry Operations on Adjacent Land/ Properties. CiteCite. http://www.citicite.com/files/Uploads/1220/Dust%20Particulant%20Distance%20Travel%20and%20Impacts%20on%20Adj%20Properties,%20incl%20Resp%20&%20Allergic%20Immune%20Responses.pdf. Publishing date Not Available. Accessed September 4, 2019.

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CHEMTEK, INC.

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